EXHIBIT A

a semiconductor chip to a lead frame with the adhesive member
and molding at least the semiconductor chip and a bonded part
between the semiconductor chip and the lead frame with a
molding compound, in which the adhesive has a coming-out-length

5   of not more than 2 mm and a water absorption rate of not more
than 3 wt.%,

    (b) a heat-resistant adhesive suitable for use in an adhesive
member for the fabrication of a semiconductor package by bonding
a semiconductor chip to a lead frame with the adhesive member

10   and molding at least the semiconductor chip and a bonded part
between the semiconductor chip and the lead frame with a
molding compound, in which the adhesive has a coming-out length
of not more than 2 mm, a water absorption rate of not more than
3 wt.% and a glass transition temperature of at least 200°C,

15   (c) a heat-resistant adhesive, in which the adhesive member
is a composite adhesive sheet comprising a heat-resistant film
and the heat-resistant adhesive applied in the form of a coating
layer on one sueface or opposite suefaces of the heat-resistant
film, and

20   (d) a heat-resistant adhesive, in which the adhesive member
consists of the heat-resistant adhesive alone.

The heat-resistant adhesives according to the present invention
have excellent package-crack resistance and are effective
especially for the improvement of the reliability of

25   semiconductor packages.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 schematically illustrates a semiconductor package fabricated by bonding a semiconductor chip to a lead frame with an adhesive member making use of a heat-resistant adhesive of the present invention and then molding the semiconductor chip and a bonded part between the semiconductor chip and the lead frame with a molding compound, in which the semiconductor chip is located below the lead frame;

FIG. 2 schematically illustrates a semiconductor package similar to that of FIG. 1 except that a semiconductor chip is located above a lead frame; and

FIG. 3 schematically illustrates a semiconductor package similar to that of FIG. 1 except that a semiconductor chip is located above a lead frame.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention will hereinafter be described in detail.

No particular limitation is imposed on the specific heat-resistant adhesive employed in the present invention insofar as its water absorption rate and coming-out length are not more than 3 wt.% and not more than 2 mm. The heat-resistant adhesive which principle constituent is a heat-resistant thermoplastic

and the positions of the semiconductor chips bonded on the lead frames are different. Each semiconductor package has been fabricated by bonding the semiconductor chip to the lead frame with the adhesive member making use of the heat-resistant

5   adhesive according to the present invention and then molding the semiconductor chip and a bonded part between the semiconductor chip and the lead frame with a molding compound.

In FIG. 1, the semiconductor is positioned below the lead frame.

10   In FIG. 2, the semiconductor is positioned above the lead frame.

In FIG. 3, the semiconductor is also positioned above the lead frame.

In FIGS. 1 to 3, there are shown the adhesive members at

15   numeral 1, the semiconductor chips at numeral 2, the lead frames at numeral 3, wires at numeral 4 and the sealants at numeral 5.

The adhesive member making use of the heat-resistant adhesive according to the present invention are effective for bonding a semiconductor chip with a lead frame so as to fabricate

20   the semiconductor package in LOC structure as illustrated in Fig. 1. The package of LOC (lead on chip) structure as shown in Fig. 1 is different from the COL (chip on lead) package of Fig. 2 and the package of Fig. 3 in that the rate of the volume occupied by the chip in the package is larger as compared with those of the two

25   others. This is because (1) the package of Fig. 1 has not a tab while the package Fig. 3 has; and (2) the wire bonding is made

above the chip in the package of Fig. 1, while it is made on the suefaces of the chip in the packages of Figs. 2 and 3, thus saving a space for the wire bonding in addition to the space where the chip is mounted. This increases the rate of the space occupied by the

5 chip in the package of Fig. 1 and accordingly reduces the thickness of the sealing material, increasing the possibility of occurrence of the package cracks due to the adhesive, as compared with the packages of Figs. 2 and 3. Thus, an effective measure for reducing the possibility of occurrence of the cracks has been awaited. The

10 adhesive of the present invention is especially effective for prevention or reduction of occurrence of the cracks in the package as shown in Fig. 1.

Without needing being limited thereto, it can also be effectively applied for the bonding of objects such as ceramic plates, metal

15 plates, metal foils, plastic films, plastic plates and laminates.

Upon bonding each of such objects, the object can be bonded to another object by coating the adhesive onto the first-mentioned object or where the adhesive is in the form of a sheet, interposing it between the objects, heating the adhesive at a

20 temperature equal to or higher to the softening point of the adhesive and then applying pressure.

The present invention will hereinafter be described specifically by the following examples. It should however be borne in mind that this invention is by no means limited to or by

25 the examples.

Example 1

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   VERIFIED   JAPAN   5-91899   03/29/93
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Foreign priority claimed 35 USC 119 conditions met	☑ yes ☐ no ☑ yes ☐ no	AS FILED ➡	STATE OR COUNTRY	SHEETS DRWGS.	TOTAL CLAIMS	INDEP. CLAIMS	FILING FEE RECEIVED	ATTORNEY'S DOCKET NO.
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